

10% of cases of psychosis.<sup>2-6</sup> The task of deciding the harms of cannabis involves what Hall and Pacula<sup>23</sup> have described as a “choice of evils” in which the rights of the majority who use cannabis without experiencing problems are balanced against the risks of a minority who may develop serious health consequences. The implications of these findings for both public health policy on cannabis, and the legal status of cannabis, are by no means straightforward or self evident. We need to develop an informed consensus on the risks posed by cannabis and the mechanisms for dealing with such risks.

**Contributors and sources:** DMF and RP are directors of the Christchurch Health and Development Study and the Dunedin Multidisciplinary Health and Development Study, respectively, and each has published extensively on the epidemiology of cannabis use. PFS is an expert on pharmacology and the neurological effects of cannabis use. JMB has published articles on the epidemiology of cannabis use and other substance use as a member of the Christchurch Health and Development Study. The article is based on a literature search through Pubmed. DMF had the idea for the article and PFS and JMB did the literature search. All authors contributed to writing the article. DMF is guarantor.

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## Science commentary: Cannabis confusions

Geoff Watts

Debates about cannabis are not confined to its value as a medicine or to its possible hazards as a recreational drug.<sup>1</sup> Something much more fundamental has been engaging the experts for years: its taxonomy. Are all plants belonging to the genus *Cannabis* mere varieties of a single species—or is it correct to recognise at least three separate species?

In his original 1753 classification, Carl Linnaeus identified just one, *Cannabis sativa*. The first indication of dissent came in 1785 when another eminent biologist, Jean-Baptiste Lamarck, was given some plant specimens collected in India. On the basis of several characteristics including their firm stems, thin bark, and the shape of their leaves and flowers, Lamarck felt that they should be distinguished from *C sativa*. Accordingly he invoked a new species, *C indica*.

In a lengthy and detailed review of the cannabis species problem, Ernest Small of the Canadian Biosystematics Research Institute commented that Lamarck

seems to have reached his decision after “relatively little study.”<sup>2</sup> He adds that “in the ‘exploratory age’ of plant taxonomy scientists often were forced to come to conclusions on the basis of very limited material.”

The third and least well founded species is *C ruderalis*. This was the name that a Russian, Janischevsky, gave to the cannabis plants he found growing in the south eastern central region of his country. The differences he noted were mostly in the size, shape, and casing of the seeds. And even Janischevsky himself seems not to have been totally convinced that these justified a new species.

Debates among “splitters” and “lumpers” over the correct classification of *Cannabis* rumbled on for much of the last century, although the lumpers seem to have won the majority vote. One commonly expressed opinion is that *indica*, *ruderalis*, and other so-called species should be regarded as no more than sub-species or even variants of *C sativa*.<sup>3</sup>

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More recently, haplotype analyses of mitochondrial and chloroplast DNA from 196 cannabis samples seized by the Australian police, has led to another subgroup dubbed (so far unofficially) rasta.<sup>4</sup> What are we to make of this addition to the fold? Not very much, in all likelihood—except a further indication that nature has little regard for human attempts to categorise it.

## Potency

Equally unhelpful are the scores of names by which the users of marijuana refer to their drug. Terms such as bhang, blow, pot, weed, dope, grass, ganja, hash, etc, bear less relation to botanical science than to the user's culture, the material's geographical origin and concentration, and methods of preparation, delivery, or use. The many websites devoted to cannabis carry subjective accounts of the various effects of the different varieties; but scientifically reliable data on the quantity of tetrahydrocannabinol—the main psychoactive ingredient in cannabis—is predictably sparse.

One organisation that publishes potency figures bearing some relation to botanical nomenclature is the Independent Drug Monitoring Unit, a research company specialising in data on UK drug use. Thus Big Bud, an *indica-sativa* hybrid is said to be 2-12% tetrahydrocannabinol by dry weight<sup>5</sup> and Haze, a late flowering *sativa* variety, is usually 6% or more. Skunk, originally another *indica-sativa* cross, comes out at 10-12%, although the label skunk now tends to be applied to any powerful strain of herbal cannabis.

## What's in a name?

Besides professional taxonomists, and possibly dealers, who cares how *Cannabis* plants are classified? Lawyers, it seems. When a Californian court convicted John Anthony Van Alstyne of selling marijuana<sup>6</sup> he appealed on several grounds, including the legal definition of the word. His advisers maintained that the

term "marijuana," as used in Californian statutes, referred only to material from *C sativa*. They argued that there was "no evidence that the marijuana involved in his case was *Cannabis sativa* L as opposed to one of the other species."

The judges accepted the appellant's claim that even experts couldn't agree over the *Cannabis* species. That said, they went on to point out that the basis of the appeal was, in essence, that when the legislature had passed the law on marijuana it "meant to outlaw the euphoric effect of the *sativa* L species but not the effect of other species." To suggest it had any such intention, declared the judges, would be absurd. They therefore concluded that, while the aim of the law was perfectly clear, scientific advance had rendered its wording obsolete. Denying Van Alstyne his appeal, they added that the statute had become "a potential trap for the unwary, and the legislature would be well-advised to rewrite the section so that it plainly says what it means."

Against a background of such fundamental ambiguity it is unsurprising to find epidemiologists and neuropharmacologists concluding that the issue is "likely to remain contentious."<sup>1</sup> Proponents of legalisation and banning confront each other through a pungent haze of smoky uncertainty.

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## A memorable accident

I fell off my bike two days ago. As I write this, I have come back to my desk, having had my dressing changed in the casualty department. The staff fussed over it a bit but pronounced the elbow wound uninfected and probably coming on well. What might have been happening today if things had been different?

I might have been shakily going home from hospital after two days' observation for a fractured skull and concussion, debating when I could safely go back to work and whether I would be able to give a conference paper next week. Or might my husband be sitting by my bed in intensive care trying to decide when to agree to my life support being turned off? Or might he already be sitting with my family discussing the funeral arrangements?

I have worn a cycle helmet consistently for some four years now, since the cumulative research evidence finally convinced me of their effectiveness. What I learnt on Sunday is that they actually work. The accident was my own stupid fault: I failed to leave enough clearance as I passed a skip parked on the side of the street. My handle bar clipped it, and before I knew it my bike was over. It wasn't a particularly hard fall, but, as I rolled over on to my back, I felt my head swing back against the tarmac with huge and unstoppable force. The sensation of not fracturing your skull is a very peculiar one. Instead, I felt the helmet thump up against the back of my head and give slightly as it came to a final halt.

When we came back from the hospital, I inspected the helmet and found the long crack all the way through the polystyrene padding at the back of the helmet: evidence of a close brush with mortality.

I have fallen off my bike many times, but I have never hit my head before and had always assumed I could protect my head in all but the most serious of falls. I now know how even a trivial fall can lead to a huge impact for the head, and that you only have to fall like that once to have the undesired effect. So I'm fine, if rather shaken, but I am not lucky to be alive. I was wearing a helmet; luck had nothing to do with it.

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We welcome articles up to 600 words on topics such as *A memorable patient*, *A paper that changed my practice*, *My most unfortunate mistake*, or any other piece conveying instruction, pathos, or humour. Please submit the article on <http://submit.bmj.com> Permission is needed from the patient or a relative if an identifiable patient is referred to. We also welcome contributions for "Endpieces," consisting of quotations of up to 80 words (but most are considerably shorter) from any source, ancient or modern, which have appealed to the reader.